ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2 Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE
6 - Management support	**0605718A - Army Modeling & Sim X-Cmd Collaboration & Integ**

	COST (In Thousands)	FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
	Total Program Element (PE) Cost	5169	5308	5357
S02	HQDA DECISION SUPPORT TOOLS & SERVICES	1693	1663	1679
S03	Analysis M&S Tools and Services	2451	2104	2123
S05	SIMULATION TECHNOLOGY (SIMTECH) PROGRAM	1025	1541	1555

A. Mission Description and Budget Item Justification: Army Modeling and Simulation Cross-Command Collaboration and Integration (M&SC3I) promotes the Army's goal to achieve affordable, interoperable and networked Modeling and Simulation (M&S) capabilities. In support of Army operations, Generating-Force functions and institutional processes, M&SC3I addresses analytical efforts underlying decision making, capability development and life-cycle costs by capitalizing on M&S technologies (accomplished through collaborative efforts of the training/operations and acquisition communities). The RDTE component of M&SC3I encompasses programs that (1) develop new M&S models and improve existing M&S models to reduce time, resources and risks associated with operational/institutional decision making and the acquisition process and (2) advance the following disciplines: M&S research, analysis and experimentation; simulation technology; and M&S tools and services. M&SC3I applies to development of tactics and doctrine, experimentation and exercises, traditional weapon system development, and assessment and transition of advanced technologies to operational capabilities. The overarching goal of M&SC3I is to reduce the time and cost of providing improved capabilities to the war fighter. Emerging information-age technologies continue to revolutionize the Army's ability to collaborate among all stakeholders using data descriptions, digital representations, and virtual prototypes to improve understanding of required capabilities, shorten procurement time, reduce procurement and sustainment costs, and, ultimately, reduce total lifecycle cost. M&SC3I advocates the use of advanced technologies to enable Future-Force capabilities through improved understanding of operational requirements, collaborative analyses of emerging technologies, and cross-domain participation in experiments and exercises. The following is a description of key programs under the three projects of PE 0605718. Under the project "HQDA Decision Support Tools and Services" the Army develops (1) the Cross-Command Collaboration Effort (3CE), (2) the Joint Integrated Analysis Tool (JIAT) and (3)the Future Land Operations Interoperability Study-Command, Control, Communications, Intelligence (FLOIS-C3I). The 3CE is a cross-command M&S and data environment for design, development, integration, and testing of capabilities, systems, and prototypes across the life cycle of a program; 3CE promotes the science and technology, analysis, experimentation, development, and testing of all products within the DOTMLPF continuum; DOTMLPF = Doctrine, Organization, Training, Materiel, Leadership, Personnel, and Facilities. The 3CE is a consistent, reliable and reusable environment that meets the common requirements of all commands and Army Program Managers (PMs) who employ M&S to conduct DOTMLPF development. The 3CE achieves significant cost avoidance by reducing duplication of effort; maximizing reuse of tools, data and services; and ensuring interoperability. JIAT is a total life-cycle integrated cost estimating tool with both system- and component-level capability. JIAT is an Army-wide, web-based tool that integrates cost estimating, engineering design, requirements, capabilities and performance models using common databases, models and tools. JIAT includes database modules that provide ready access to cost and technical data in each commodity area (Aircraft, Missiles, Command and Control, Intelligence/Electronic Warfare, Weapons/Tracked Combat Vehicles) and is designed to conduct Cost As Independent Variable (CAIV) analysis. The JIAT integrated data environment enables optimization of battlefield effectiveness and provides the technology to control life-cycle costs based on analyses of future capabilities and program requirements. FLOIS-C3I is a study that examines the concepts required to integrate a United Kingdom (UK) brigade into a US Future-Force division. Under the project "Analysis M&S Tools and Services," the Army develops common and cross-cutting M&S tools for concept development, analysis, acquisition, evaluation and experimentation. The primary developers/users of these tools are the

Training and Doctrine Command Analysis Center (TRAC), the Army Materiel Systems Analysis Activity (AMSAA), and the Center for Army Analysis (CAA). Additionally, Army M&S Capability Area Teams (CATs) conduct HQDA-directed research to develop solutions for high priority M&S objectives impacting current and future operations. CATs focus, first and foremost, on areas that have near-term operational impact or have been difficult to model but are, nonetheless, critical to closing capability gaps. Under the project "Army Simulation Technology (SIMTECH)," the Army enhances Current and Future Force effectiveness by inducing research organizations on an immediate/short-term basis to conduct high-priority, promising simulation research initiatives that are outside the scope of Small Business Innovative Research and Army Science and Technology programs. SIMTECH directs simulation research initiatives toward immediate and short-term Army needs and serves as a catalyst for major technology breakthroughs in M&SC3I, embedded simulation, rapid prototyping, commercial innovation, and related simulation technology.

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B. Program Change Summary	FY 2008	FY 2009	FY 2010
Previous President's Budget (FY 2009)	6302	5325	5445
Current BES/President's Budget (FY 2010)	5169	5308	5357
Total Adjustments	-1133	-17	-88
Congressional program reductions		-17	
Congressional rescissions			
Congressional increases			
Reprogrammings	-956		
SBIR/STTR Transfer	-177		
Adjustments to Budget Years			-88

ARMY RDT&E BUDGET ITEM JUSTIFICATION (R2a Exhibit)

May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605718A - Army Modeling & Sim X-Cmd Collaboration & Integ**	**S02**

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
S02	HQDA DECISION SUPPORT TOOLS & SERVICES	1693	1663	1679

A. Mission Description and Budget Item Justification: The project "HQDA Decision Support Tools and Services" provides decision support tools and services for the Army staff and forward operating agencies assigned to the Headquarters, Department of the Army. Two tools are receiving funds under this project during FY08-10. These are the Cross-Command Collaboration Effort (3CE) and the Joint Integrated Analysis Tool (JIAT), the latter sponsored by the Deputy Assistant Secretary of the Army for Cost and Economics (DASA-CE). The 3CE is a cross-command M&S and data environment for design, development, integration and testing of capabilities, systems and prototypes across the life cycle of a program; 3CE promotes the science and technology, analysis, experimentation, development, and testing of all products within the DOTMLPF continuum; DOTMLPF = Doctrine, Organization, Training, Materiel, Leadership, Personnel and Facilities. The 3CE is a consistent, reliable and reusable environment that meets the common requirements of all commands and Army Program Managers (PMs) who employ Modeling and Simulation (M&S) to conduct distributed DOTMLPF development. The 3CE identifies, develops, integrates and maintains a core set of M&S tools, data and business processes; develops, maintains and provides interoperable connectivity to link the participating organizations; and provides the common 3CE environment and expertise to leverage 3CE capabilities. The 3CE enables a responsive simulation environment that inculcates consistency along a program's life cycle as it executes the Joint Capabilities Integration and Development System (JCIDS) and acquisition processes. The 3CE process achieves cost avoidance by reducing duplication of effort; maximizing reuse of tools, data and services; and ensuring interoperability. The 3CE provides the Army with a viable business model to ensure readily modifiable integrated solutions across parallel command and organization efforts. JIAT is a multi-linked system that integrates cost estimating tools, engineering design models, requirements, capability models and performance models appropriate for current and emerging technologies. JIAT enables analysts to optimize battlefield effectiveness at an affordable cost by providing databases, models and tools (common to all components) in a readily accessible Army-wide, web-based integrated environment. Solutions resulting from JIAT application increase the quality and maintainability of fielded war-fighting systems while controlling/reducing system life-cycle costs. The robust analysis performed through JIAT appreciably improves usage/dissemination of information and increases the efficiency, scope and clarity of the decision-making capabilities required by the acquisition process. A third effort -- Future Land Operations Interoperability Study-Command, Control, Communications, Intelligence (FLOIS-C3I) -- is funded in FY08, FY09 and FY10 under the project "HQDA Decision Support Tools and Services." FLOIS-C3I is a study examining the concepts required to integrate a United Kingdom (UK) brigade into a US Future-Force division. The primary purpose of FLOIS-C3I is to identify the desired level of UK-US battle command interoperability when incorporating a UK brigade into a US Future-Force division. A fourth effort, funded in FY08, is the development of an architecture for data standardization across the M&S enterprise.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
FY08-10, Cross-Command Collaboration Effort (3CE). Funds will enable the Army to expand 3CE across the entire Army (beyond the Future Combat Systems -- its current use) to develop System-of-Systems concepts, prototyptes, and test and evaluation methodologies.	1093	1116	1279
FY08-10, FLOIS-C3I. Funds will enable identification of tasks, conditions and standards necessary to integrate a UK medium-weight brigade into a US Future Force division and overcome the identified capability gaps.	300	500	400
FY08, Joint Integrated Analysis Tool (JIAT). JIAT was formerly known as the Integrated Performance Cost Model (IPCM). In FY08, DASA-CE will update, test and validate the component level cost model; populate the database; and update the prototypes provided to the	149		

Tank and Automotive Command (TACOM). In FY09, DASA-CE completes additional collection of data for cost estaimating, model integration and standardization.			
FY08, Development of an architecture for data standardization across the M&S enterprise. For each Army community of interest, the Army Materiel Systems Analysis Activity (AMSAA) assists in the process to determine types of tool being used, issues addressed by these tools, and data used by these tools.	151		
Small Business Innovative Research/Small Business Technology Transfer Program		47	
Total	1693	1663	1679

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May 2009

BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605718A - Army Modeling & Sim X-Cmd Collaboration & Integ**	**S03**

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
S03	Analysis M&S Tools and Services	2451	2104	2123

A. Mission Description and Budget Item Justification: Under the project "Analysis M&S Tools and Services" the Army develops Modeling and Simulation (M&S) tools and services (e.g., hardware, software, infrastructure) for the Army's analysis community. The primary users of these tools and services are the Training and Doctrine Command Analysis Center (TRAC), the Army Materiel Systems Analysis Activity (AMSAA), and the Center for Army Analysis (CAA). Efforts focus on (1) development of analysis tools that will enable assessment of emerging technologies during concept exploration and (2) development of infrastructure and enabling technologies to support the Current and Future Force. These critical efforts are required for analysis-of-futures work to justify Army requirements, assessment of alternative approaches to satisfy those requirements, and development of current and emerging war fighting doctrine from tactical to operational levels of warfare. Many efforts funded under this project are chosen by Army M&S Capability Area Teams (CATs), who conduct HQDA-directed research to develop solutions for high priority M&S objectives impacting current war fighting capabilities. CATs focus, first and foremost, on areas that have near-term operational impact or have been difficult to model but are, nonetheless, critical to closing capability gaps.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
FY08-10, Advanced Signals Intelligence (SIGINT) simulation capability. Funds will enable the Army to represent in simulation the SIGINT technologies and capabilities now an essential part of the Cost of War (COW).	400	400	400
FY08-10, Army modeling and simulation data strategy. Funds will enable the M&S community to collect, store and disseminate data as part of the Cost of War (COW).	400	400	400
FY08-10, Capability gaps identified by M&S CATS. Funds will enable Army to find M&S solutions to capability gaps in airspace command and control, rapidly developing networks, battle command systems, irregular warfare, counter-insurgency operations, and other areas. FY09 funds focus heavily on irregular warfare, identified in the January 09 "Quadrennial Roles and Missions Review" as one of four primary roles of DoD.	1563	1246	1323
FY08, Research in adversary cyber-protection measures for irregular warfare. Funds will enable Army to identify cyber-force protection measures used by adversaries and develop a shared database of these measures for implementation of current and future analyses.	88		
Small Business Innovative Research/Small Business Technology Transfer Program		58	
Total	2451	2104	2123

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BUDGET ACTIVITY	PE NUMBER AND TITLE	PROJECT
6 - Management support	**0605718A - Army Modeling & Sim X-Cmd Collaboration & Integ**	**S05**

COST (In Thousands)		FY 2008 Actual	FY 2009 Estimate	FY 2010 Estimate
S05	SIMULATION TECHNOLOGY (SIMTECH) PROGRAM	1025	1541	1555

A. Mission Description and Budget Item Justification: The Army Simulation Technology (SIMTECH) program enhances Current and Future Force effectiveness by inducing Modeling and Simulation (M&S) research agencies and organizations to conduct high-priority, promising simulation technology research that is outside the scope of the Small Business Innovative Research (SBIR) and the Army science and technology programs. The SIMTECH program provides a source of competitive funds to Army research agencies and organizations to stimulate high quality, innovative M&S research with significant opportunity for payoff in Army war fighting capability. The SIMTECH program focuses simulation technology research initiatives on immediate short-term Army capability requirements by including a theme in the annual call for proposals. The SIMTECH program serves as a catalyst for major M&SC3I-related technology breakthroughs in embedded simulation, collaboration, rapid prototyping, commercial innovation, and related simulation technology. (M&SC3I = Modeling and simulation Cross-Command Collaboration and Integration.) Successful SIMTECH projects are generally transitioned to start-up projects and existing Army simulation programs. SIMTECH-activities are performed by the Army Materiel Command, the Army Corps of Engineers Engineer Research and Development Center, the Army Research Institute, the Army Training and Doctrine Command Analysis Center, the Program Executive Office for Simulation, Training and Instrumentation (PEO-STRICOM) and other Army agencies.

Accomplishments/Planned Program:	FY 2008	FY 2009	FY 2010
FY08-10, Mobility Common Operational Picture (MCOP) effort; geoBattlefield Management Language (geoBML); and integrated use of common geo-environmental, maneuver, and command and control behaviors across battle command systems. Funds will enable Army to improve commonality and consistency in the simulation results of an operations plan (OPLAN) during mission rehearsal.	625	500	500
FY08-10, GIS-Enabled Modeling and Simulation Project (GEMS) (GIS = Geospatial Information & Services). Funds will increase interoperability of M&S and C4ISR systems with GEMs. (C4ISR = Command, Control, Communication, Computers, Intelligence, Surveillance, reconnaissance.)	400	400	400
FY09-10, Improvement of the C4ISR component of M&S, identified by SIMTECH managers as a high-priority requirement.		597	655
Small Business Innovative Research/Small Business Technology Transfer Program		44	
Total	1025	1541	1555